

Q1

Risk-return equilibrium

Steps in process

1) Find last years realised return

WHL

Share price 2016/100 17.64

Share price 2017/100 17.69

Realised return 17.69/17.64

= 0.28%

Market

CRI 2012 49771

CRI 2013 50694

Realised return 50694/49771

= 1.85%

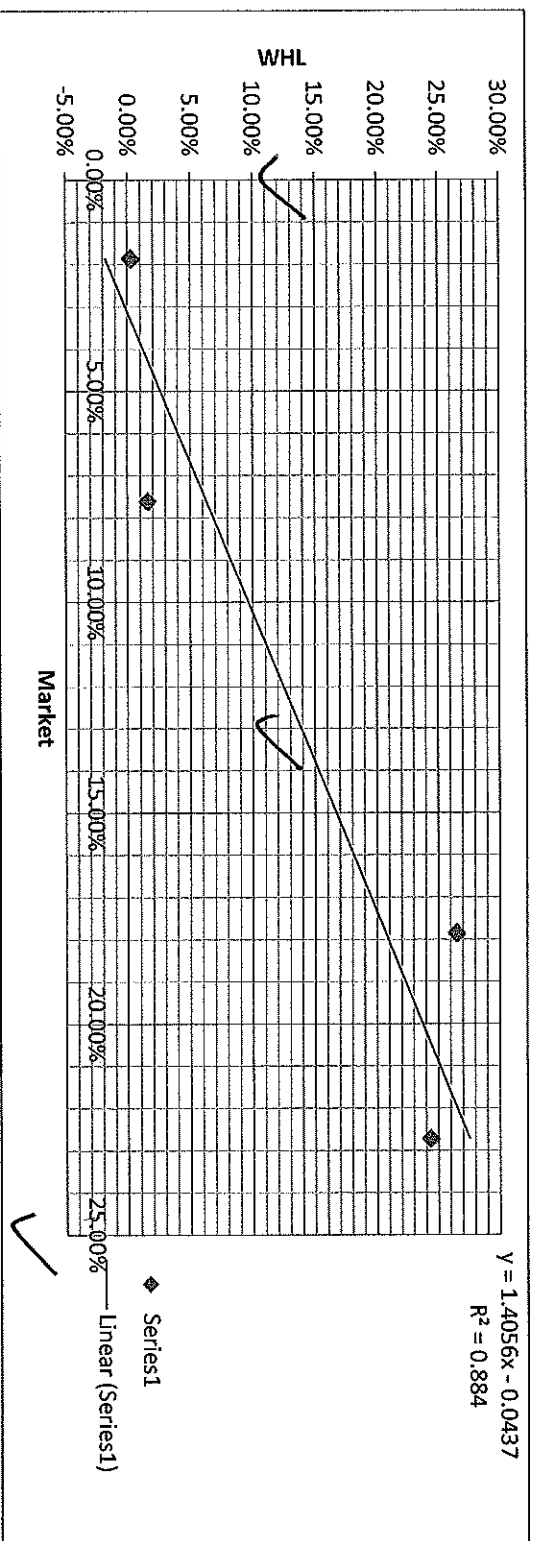
Year	Share price	Rate return		CRI Index	CRI Rate return
2012	11.03	24.39%	✓	31986	22.71%
2013	13.72	26.53%	✓	39250	17.85%
2014	17.36	1.61%	✓	46256	7.60%
2015	17.64	0.28%	✓	49771	1.85%
2016	17.69			50694	
2017					

Graph input	
22.71%	24.39%
17.85%	26.53%
7.60%	1.61%
1.85%	0.28%
0.00%	0.00%

AVG 12.50% 13.20%

Beta per graph	1.41	✓	Beta - Rise / Run	1.43
Rise / Run	Y1		10 10 - 0 / 10 - 3	1.43
	Y0		0	
	X1		10	
	X0		3	

Find beta



Assumption- Riskfree rate	8.00%
Market return for past year	1.85%
CC return for past year	13.20%
Beta according to rise over run	1.41

Use CAPM to determine required return (risk free rate; Market return ; beta)

RR = R_f + beta (R_M - R_f)

$$RR = 8 + 1.41 (13.2 - 8)$$

Therefor RR = 14.35%

✓ ✓ ✓ ✓

Draw SML (Risk free rate; and market beta)

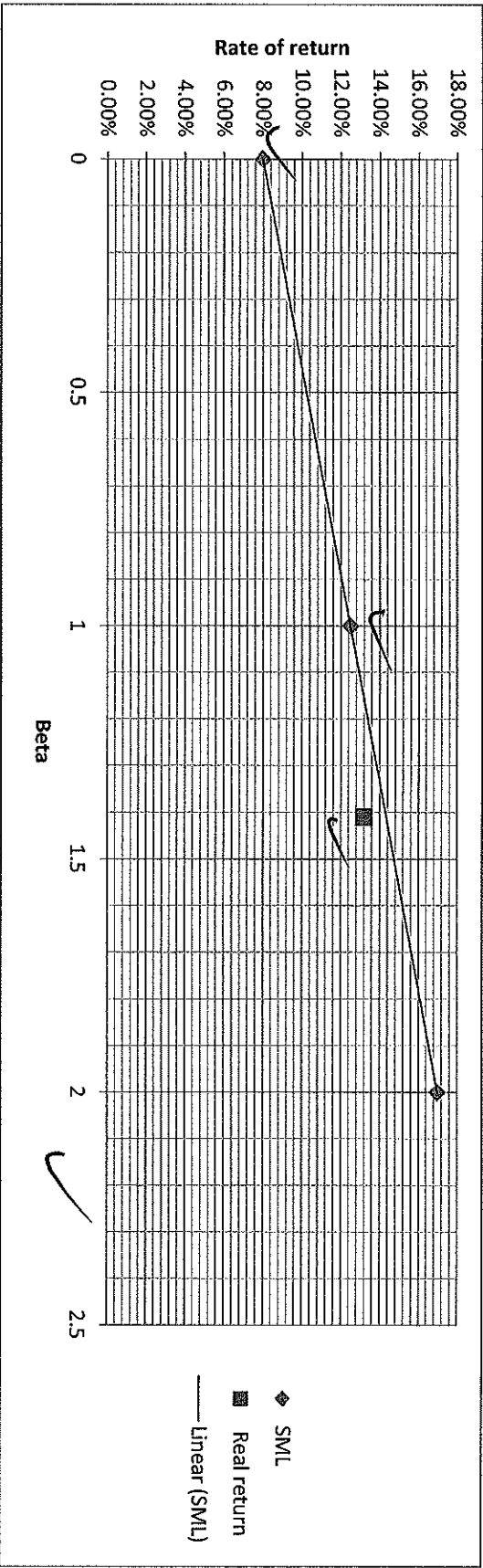
Beta Return

Beta Real return

0	8.00%	R_f
1	12.50%	R_m
2	17.01%	

1.41	13.20%	0.28%
------	--------	-------

$RR = R_f + \text{beta} (R_m - R_f)$
 (for beta = 0 and 1)



Compare realised return with required return	
Realised return	13.20% ✓
Required return	14.35% ✓

Over- under-, fairly valued

Company under valued

Realistic price based on assumptions and limited data

Current share price	R 17.69	17.69 * 13.2 / 14.35
"Realistic" price	= ?????	

Avg Share growth		R 16.28
Div growth		R 14.36
Sustainable growth		R 12.62

Manage share price next year
Steps in process
2) Find realistic growth rate

Sales growth (last years sales / previous years sales) compares to L term and stable Operating profit margin unlikely to repeat - unless acquisition but if profit margin do not increase accordingly then "no" productivity increase- should not have exponential effect on share price.

Retention growth (Retention rate X Return on Equity) can use offers limited information on variables to manage and also Sustainable growth is required for Q2.

Sustainable growth: $(m(1-d) A/E) / (A/S - m(1-d) A/E)$ used for reasons given above

Sales growth approach

Sales	2017	R 9 266 251
Sales	2016	R 8 530 237
Sales growth		Sales new / Sales old
Sales growth past year		8.63%
Avg sales growth for	2012	2017
	9.10%	

Year	Sales		Year	DPS	EPS
2013	R 6 542 321		2013	43	113.8
2014	R 7 223 863	10.42%	2014	28.4	116
2015	R 7 996 461	10.70%	2015	32	119.9
2016	R 8 530 237	6.68%	2016	32	102.7
2017	R 9 266 251	8.63%	2017	56	173.6
			Avg div	38.28	125.2
Avg	9.10%		Avg Div payout		30.58%

Expected return approach

Return on equity	13.37%	EPS	125.2
Retention rate	69.42%	DPS	38.28
Retention Growth Model	ROE * Retention Rate	Retention rate	69.42%
Retention Growth rate	9.28% (?)		

Find old dividend and adjust for calculated growth

Dividend	2017	R 0.38
Growth rate as calculated		9.28%
Current Share price		R 17.69

Expected return (Expected Dividend / Current price + growth)

MARKS
FOR 1
ONLY

$$\text{Expected return} = D1/P0 + g = R0,38 \times 1,0928 / R7,69 + 0,0928 = 11.65\%$$

Use SML as per 1 for determining equilibrium

Compare expected rate of return to a required return of for a beta as determined means unless share price goes down it will still be over valued. Can also plot on SML graph as previously

Realistic price based on assumptions and limited data

Current share price = 17.69 x (11.6/14.35)

= R 14.36

Fin variables tc 1 2 3 4 5 6 7

Impact decrea: 1 2 3 4 5 6 7

Q2

Sustainable Growth Rate

Part 1

(m (1-d) A/E) / A/S - m(1-d) A/E

Profit Margin (m)

Retention rate = (1-d) - (d = Dividend payout rate)

Assets

Equity

Sales

Net Profit

Sustainable Growth rate

3.73%

69%

R 5 474 837

R 2 584 848

R 9 266 251

R 345 661

10.23%

$$0,0373 \times 0,6942 \times (5474837 / 2584848) = 5474837 / 9266251 - 0,0373 \times 0,6942 \times (5474837 / 2584848)$$

4k used in Q1 then Q2
5 marks and 2 marks for Q2

Q2

1)

Share price equilibrium based on future scenario

Steps in process

Find last years realised turnover

Assume rate of return drops / increases in relation to drop / increase in sales

Find last years realised return (or a defendable value) last year acquisitions made. Based on longer term avg sales growth seems to be

around 11% the 23% of past year considered to high - due to acquisition

Calculate Beta

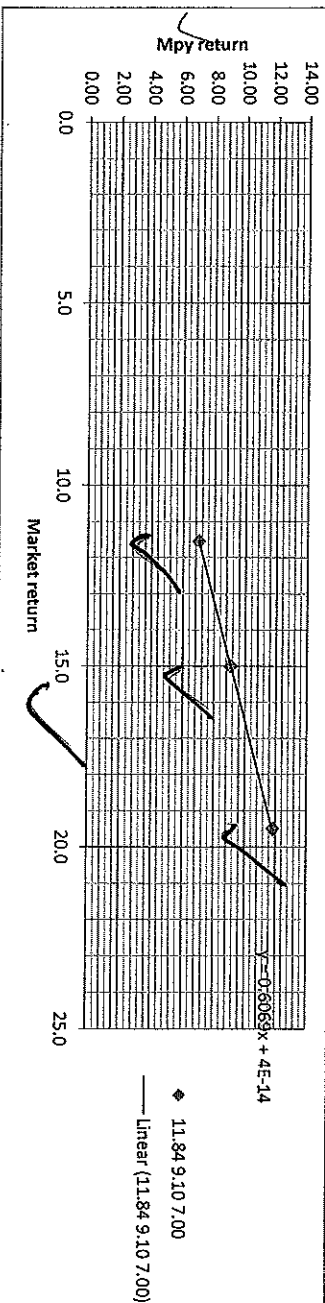
Expected return for Mpy based on long term average sales growth rate of 1.1%				
Expected return in case of increase in sales				11.84
Most probable situation				9.10
Expected return in case of decline in sales situation				7.00
Expected return for the stock exchange assume long term growth rate of around 15%				9.10%
Expected return in case of increase in sales				19.5
Most probable situation				15
Expected return in case of decline in sales situation				11.54
				15% / (1 + 0.3)

Prob	Market	Mpy
0.35	19.5	11.84
0.4	15.0	9.10
0.25	11.5	7.00

Can use other value

CAPM Assumptions			
Riskfree rate		8%	
Market return (LT)		15%	
Beta (in graph) (rise over run)		0.61	
Required return =		8 + 0.61(15-8)	
		12.27%	

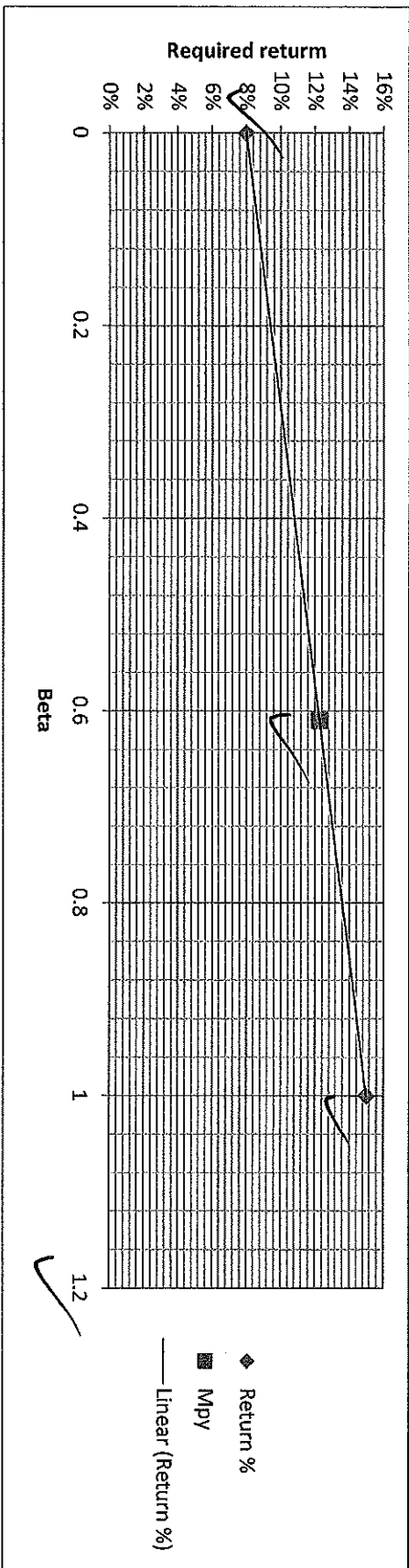
DETERMINE BETA (NB CAN DO RISE/RUN)



Draw SML (Risk free rate, and market beta)

beta	Return %
0	8%
1	15.00%

Mpy	Mpy
Beta	Return %
0.61	12.27%



Fairly valued under current set of assumptions

2)	Manage share price based on sustainable growth rate
	Steps in process
	Sustainable growth rate as per Q1 ✓ 10.23% (Unrealistic)
	Retention growth as per Q1 ✓ 9.28% (Realistic given history)
	Proposals for management should pivot around increasing rate of return specifically profitability <i>8 weeks</i>
Q 3	
	To determine if it makes sense to invest in a portfolio as suggested
	Steps in process
	Determine reference / benchmark return
	Determine expected / required return for share and market

Determine stand-alone risk /beta for scenario for 1) the share for 2) the market
Compare stand-alone risk for 1) share with 2) the market using CV
Determine stand-alone risk for portfolio
Compare stand-alone risk or portfolio (beta) for 1) share and 2) the market with the portfolio using interalia CV

Find expected beta (NB problem limited data points relate to old beta)			
Expected return in increase in sales situation		✓ 13.20	9.10% x (1 + 0.3)
Most probable situation		✓ 11.00	9.10%
Expected return in decline in sales situation		✓ 8.46	9.10% / (1 + 0.3)

Mjby									
Scenario	Prob	return	E (RS)	E (R) - E(RS)	C ²	C ² X P			
High	0.35	1183.52	414.23	230.05	52923.39	18523.19			
Base	0.4	910.40	364.16	-43.07	1854.93	741.97			
Poor	0.25	700.31	175.08	-253.16	64090.48	16022.62			
		E (R)	953.47		Variance	35287.78			
					SD	187.85			
					CV	0.20			

For the stock exchange assume long term growth rate of around 15 %									
Expected return for increase in sales situation							✓ 19.50	15% x (1 + 0.3)	
Most probable situation <i>(could use other value)</i>							✓ 15.00	15%	
Expected return for decline in sales situation							✓ 11.54	15% / (1 + 0.3)	
Market									
Scenario	Prob	return	E (RS)	E (R) - E(RS)	C ²	C ² X P			
	P	A	B	C	C ²	C ² X P			
High	0.35	19.5	6.83	3.79	14.37	5.03			
Base	0.4	15	6.00	-0.71	0.50	0.20			
Poor	0.25	11.54	2.88	-4.17	17.40	4.35			
		E (R)	15.71		Variance	9.58	✓		

					SD	3.10	✓
					CV	0.20	✓
Portfolio expected return (Mpy 60% en Market 40%)							
	Scenario	Mpy Return	Market Return	E	Prob P	E x P	
	High	13.2	19.50	✓ 15.72	0.35	5.50	
	Base	11	15.00	✓ 12.60	0.4	5.04	
	Poor	8.5	11.54	✓ 9.69	0.25	2.42	
		E (R)				12.97	
Portfolio							
Scenario	Prob P	return A	E (RS) B	E (R) - E(RS) C	C ²	C ² x P	
High	0.35	15.72	5.50	2.75	7.59	2.66	
Base	0.4	12.60	5.04	-0.37	0.13	0.05	
Poor	0.25	9.69	2.42	-3.27	10.71	2.68	
		E (R)	12.97		Variance	5.39	✓
					SD	2.32	✓
					CV	0.18	✓

Based on CV it would make a difference if on invest in a portfolio (NB assumptions played a significant role to create this situation)

✓